FURTHER CONSIDERATIONS OF THE MECHANISM OF EAR VERTIGO AND ITS RELIEF BY REMOVAL OF THE INCUS.

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In The American Journal of the Medical Sciences, October, 1896, I published my observations in a number of cases of ear vertigo and recorded my experiences with the surgical removal of the incus for relief of this disease. In this paper I present some original considerations as to the mechanism and paroxysmal nature of chronic ear vertigo, or chronic tympanic vertigo, as I prefer to name it, because the cause of it originates in chronic disease of the tympanic cavity, and append the record of a case of parotitic ear vertigo cured after a year's duration by a removal of the incus. It is the second case of chronic ear vertigo consecutive to mumps I have entirely cured by removal of the incus. The first case was reported in the article in this Journal referred to above.

Unfortunately, all forms of ear vertigo are usually and indiscriminately called "Ménière's disease." The latter is indeed ear vertigo, but ear vertigo is not always "Ménière's disease." Ear vertigo may be due to disease in the external, middle, or the internal ear. The term "Ménière's disease," if it means anything definitely, means internal ear vertigo, due to an apoplectiform lesion of the labyrinth of the internal ear; but there is little or no evidence that such lesions ever occur in the internal ear without previous catarrhal disease in the middle ear, the capillary bloodvessels of which are intimately connected with those of the internal ear. Middle-ear vertigo, or tympanic vertigo, is due primarily to chronic catarrhal disease in the tympanic cavity and the consequently altered condition and mechanism of the ossicles of hearing. External ear vertigo is due to disease in the external ear.

All of these three forms of ear vertigo present very similar symptoms, such as are termed "Ménière's symptoms," viz., more or less deafness and tinnitus, with paroxysmal vertigo, nausea, vomiting, reeling, and often falling, but no loss of consciousness. The last-named symptom is a ready means of differential diagnosis between ear vertigo and epilepsy, alcoholism, and apoplexy, with all of which ear vertigo is sometimes confounded. There are two forms of what may be termed pseudo ear vertigo, viz., vertigo due to a tumor in the tract of the auditory nerve and vertigo due to traumatism of the ear in connection with traumatism of the cranium. In both of these pseudo ear vertigoes the cause does not arise in the ear, but from irritation conveyed to it. In these cases vertigo is more or less constant, and rarely if ever as violent as in the pathognomonic paroxysms of true ear vertigo.

Ear vertigo is due to irritation emanating from some part of the auditory apparatus and conveyed through the ampullæ of the semicircular canals to the motor filaments of the auditory nerve, the peduncles, and the cerebellum; hence the disturbed coördination called ear vertigo. Such irritation may be excited either by undue retraction and impaction of the stapes in the oval window, and consequent compression of the labyrinth fluid and the ampullæ, as in the late stages of chronic catarrhal otitis media. If engorgement of the labyrinth and pressure upon the ampullæ from within the cranium be present, as in parotitic metastasis, such pressure-irritation may be increased at times by sudden retraction and impaction of the chain of ossicles and the foot-plate of the stapes, as occurs in sudden movements of the head, or in an accommodative contraction of the tensor tympani, unnoted by the normal labyrinth, and a paroxysm of ear vertigo takes place. With the labyrinth unduly engorged, as in a case of metastasis, ear vertigo occurs if a sudden increase in the quantity of labyrinth fluid takes place when the stapes is held too firmly in the oval window to yield to this pressure upon its foot-plate from within. This amounts to the same force as sudden impaction of the stapes, since the labyrinth space is compromised by the failure of the stapes to move outward, and ear vertigo results from pressure-irritation in the ampullæ. The latter process is most likely to take place in the late stages of chronic catarrh of the middle ear; but in both instances the process is essentially a mechanical one, viz., a disturbance in the muscular tension and mobility of the auditory apparatus in the middle ear, and we have therefore to deal with a mechanical disease.

The paroxysmal nature of ear vertigo can be explained only by assuming that it is due to temporary increase in retraction and impaction of the stapes in the oval window or temporary engorgement of the labyrinth from within, without compensatory yielding of the stapes, and a consequent pressure on the labyrinth water and the ampullæ. That such is the mechanism of ear vertigo is demonstrated by the curative effect of removal of the incus and liberation of the stapes. Why true ear vertigo occurs paroxysmally cannot be easily explained, but I venture to suggest that it is due to varying degrees of tension in the chain of ossicles or in the labyrinth fluid. The latter, being a part of the lymph system of the subarachnoid space (Hasse), must be subject to varying conditions of tension, as are the ventricles of the brain or the cerebro-spinal fluid. Ordinarily the compensatory yielding of the fenestræ of the labyrinth toward the drum cavity is sufficient to prevent undue pressure in the ampullæ and vertigo. If, however, these yielding points are stiffened as in chronic middle-ear catarrh, in which there is always more or less retraction and impaction of the stapes and thickening of the membrane of the wound window, then either an increased quantity of endolymph or perilymph or both, emanating from the cranial cavity, or a spasmodic or further retraction of the chain of ossicles and impaction of the stapes from tympanic causes, as occur in chronic aural catarrh, is competent to excite a paroxysm of ear vertigo.

If the liability to these paroxysmal impactions of the stapes can be prevented and greater freedom given to the movement of the stapes outward when its foot-plate is pressed upon from within, ear vertigo from the causes mentioned can be prevented. Such immunities can be granted by removal of the incus and consequent liberation of the stapes. In twenty-seven cases of ear vertigo in which I have thus liberated the stapes, entire freedom from incapacitating attacks of ear vertigo has followed the operation. This relief has not always come at once, as long a time as six months having elapsed in some instances before entire relief has been obtained; but in some of the worst cases immediate relief has followed the removal of the incus, as in the case I have reported below. In a few cases the tinnitus has been entirely relieved and in the rest of the cases greatly diminished by the operation. The hearing, uniformily very defective in true ear vertigo, has been uninfluenced by this operation.

The following case of ear vertigo presents much to interest both the general and special practitioner:

Mr. J. W. S., a strong, healthy man, of good habits, conductor on a trolley car, consulted me for the first time on October 14, 1898. He stated that in September, 1897, he had contracted mumps from his little son and had had the disease on both sides. The left parotid gland was attacked first, and then, four days later, the right parotid was attacked. Four days later the left testicle became greatly swollen and intensely painful, and four days later the right testicle was attacked, but less severely. It is stated that no alteration in sexual power has resulted from the orchitis. Two or three days after the orchitis had appeared on the right side the patient had an attack of pleurisy on the right side, which lasted from ten to twelve days, with fever and great pain. The metastatic tendency of this malady is thus sharply demonstrated in this case. On the left side there were pain, tenderness, and swelling about the ear, with shooting pains in the ear, unattended, however, with discharge. Before the parotitis both ears were entirely normal. While still confined to the bed with mumps the patient perceived tinnitus in his left ear and noticed that he was deaf in this ear. As soon as he was able to get up and move about he observed a marked tendency to attacks of vertigo, the tinnitus and deafness continuing. Attacks of vertigo were excited by rapidly moving objects, by his own sudden and voluntary movements of his body or eyes, and also by the rapid motion of the trolley car when he resumed his duties as conductor. The apparent motion of objects has always been toward his left side, and he has felt a tendency at times to reel and fall toward his left. Preceding any vertiginous attack there has been an increase of tinnitus in his left ear, and usually a coppery taste in his mouth, perhaps most marked on the left side of his tongue. This latter gustatory prodrome of an attack of ear vertigo I have never noted before. An increase of tinnitus before an attack of tympanic vertigo is pathognomonic.

After an absence from work for six weeks he resumed his duties as car conductor, but could work only off and on between November 15, 1897, and May 8, 1898, being interrupted by frequent attacks of vertigo, nausea, and vomiting. The longest period of freedom from ear vertigo was two weeks. Three or four times in the above-named period of six months his attacks were so bad while conducting his car that he had to close his gates, lie down in the car, and return to the car-house.

From May 8th to October 14, 1898, the attacks of ear vertigo diminished in frequency but increased in intensity. He felt great timidity in going about alone, and stopped work entirely. Such agorophobia is quite common in chronic ear vertigo.

During all this period of about a year he consulted a number of physicians, some of whom recognized the nature of his malady as an aural one, while others apparently did not. Neither their local nor general treatment gave the patient relief. In October, 1898, Dr. A. G. Miller recognized his malady as ear vertigo, and sent him to me for operation.

Examination at that time revealed a normal membrana on the left side, but profound deafness; conservation of bone conduction for the tuning-fork; constant tinnitus; general health excellent; unwillingness to conduct his car for fear of vertigo and falling.

Having established the existence of chronic tympanic vertigo in this case, removal of the incus was proposed, the patient placed in a private room of the Presbyterian Hospital, and on October 18, 1898, he was etherized, and the external auditory canal sterilized with formalin solution (1 : 1000) and illuminated by an electric head lamp. A long incision was then made in the posterior periphery of the membrana, beginning behind the short process of the hammer and running almost half-way around the membrane. There was no bleeding, and the incus-stapes joint was thus well exposed. The incus was then detached from the stapes by my incus hook-knife, drawn downward into the atrium, and removed by slender foreign-body forceps (Sexton's pattern). The stapes head was now plainly seen, and when touched with a probe was found to be normally movable. The next day the stapes was plainly visible in position. The hearing for the voice apparently slightly increased. A little discharge of clear, pink serum came from the ear. Tinnitus unchanged. There being no tendency to vertigo, the patient began his work as car conductor four days after the operation, and has continued to do so up to the present time, though ten days after the operation he took cold, and had a mild attack of acute otitis media in the ear operated upon. This ear discharged for a month and then ceased, the perforation closing. December 2, 1898, I made a note that the deafness was still great and the tinnitus continuous in this ear, but there was no tendency to vertigo, to relieve which the operation was performed. The patient is able to do full work, and was on duty twenty-six hours during the recent great snow-storm.

In the case reported above parotitic metastasis occurred in the left internal ear and probably some degree of catarrhal inflammation in the middle ear. The metastasis in the labyrinth produced engorgement of that cavity and destruction of hearing, but not of the special irritability of the ampullæ of the semicircular canals. The ready mobility of the stapes in this case, as was demonstrated by a probe at the time of the operation, rendered the patient specially liable to an attack of vertigo from a sudden retraction of the ossicles by the tensor tympani, impaction of the stapes upon the over-distended labyrinth, and consequent undue compression of the ampullæ. Such liability has been overcome by the removal of the incus and the consequent destruction of the retractive power of the tensor tympani and malleus upon the stapes.

A CASE OF ISOLATED URTICARIA OF THE TONGUE, ASSOCIATED WITH ACHLORHYDRIA.

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Occasionally in individuals affected by urticaria of the skin the mucous membrane of the mouth becomes the seat of analogous manifestations. Such an involvement receives but brief mention from writers on diseases of the skin, while an isolated occurrence of urticaria upon the oral mucous membrane has apparently not hitherto been observed.

The following case seems to be unique so far as is indicated by an examination of the literature:

Local phenomena. The patient, a man, aged thirty-eight years, shoemaker by trade, was first seen October 16, 1897, for soreness of the tongue. He stated that four years previously reddened, sensitive areas made their appearance on the dorsum of the tongue, coming and going irregularly for several months, later increasing in frequency of occurrence as well as in soreness, until two years ago, when he was obliged to give up his work, in which it was necessary to hold shoe tacks in his mouth. Owing also to the sensitiveness of the tongue, he discontinued the use of tobacco, which he had formerly smoked and chewed freely. For the past two years the lingual dorsum has been almost constantly affected by sore, red areas. Recently the mucous membrane of the cheeks and lips has occasionally shown similar manifestations. The skin has at no time exhibited an eruption, so far as he can recall.

When first seen by the writer (J. L. G.) the oral cavity presented the following appearances: The dorsum of the tongue from the circumvallate papillæ to within a centimetre of the tip presents, with the exception of a normal-looking oval area in the centre, about one by one and a half centimetres in diameter, conspicuous alterations of the surface. In this affected region the filiform and fungiform papillæ are moderately